

Weekly Quiz Answers (28th Jan- 3rd Feb)

Ans 1. B

Explanation:

Acid Rain is a complex environmental issue with various causes and widespread consequences, originating from Fossil Fuels.

About

- Acid rain or acid deposition encompasses any precipitation with acidic components, such as sulfuric or nitric acid, falling to the ground in wet or dry forms.
- Includes rain, snow, fog, hail, or acidic dust.

Formation of Acid Rain

- SO₂ (Sulphur Dioxide) and NO_x (Nitrogen Oxide) combine with water and oxygen, forming sulfuric acid (H₂SO₄) and nitric acid (HNO₃).
- These acids dissolve in water droplets, resulting in the formation of acid rain, snow, or fog.
- Typical pH of acid rain is around 4.2-4.4, more acidic than normal rain (pH around 5.6).
- Carbon monoxide does not react with water to form an acid. So, it would not contribute to acid rain.

Ans 2. B

Explanation:

Scientists have recently achieved the seamless integration of brain-like tissue with electronics, resulting in the creation of Brainware, an 'organoid neural network (ONN)' capable of recognizing voices and solving complex mathematical problems.

About

- Brainware is an innovative computing system that combines brain-like tissue with electronics.
- It integrates brain organoids with microelectrodes, forming an 'organoid neural network (ONN)' that directly incorporates living brain tissue into the computing process.
- Brain organoids are 3D tissues derived from human embryonic stem cells, simulating the structure and function of the human brain and used to study human brain development and related diseases. Currently under the MSDE's jurisdiction.

Ans 3. A

Explanation:

Snow Leopard Population Assessment in India (SPAII) Program

- Conducted by the Wildlife Institute of India (WII) with support from snow leopard range states and conservation partners.
- Spanning 2019 to 2023, covering over 70% of potential snow leopard range using a two-step framework.
 - Step 1: Evaluate spatial distribution through occupancy-based sampling.
 - Step 2: Estimate abundance using camera traps in identified stratified regions.

Significance of the SPAII Program

- Essential for long-term survival with consistent monitoring.

- Recent surveys provide a clearer understanding of the snow leopard range in India compared to earlier estimates.
- Data showcases coexistence between local communities and snow leopards.
- Regular assessments offer insights for identifying challenges, addressing threats, and formulating conservation strategies.

Answer 4. C

Explanation:

Article 85 of the Indian Constitution empowers the President to summon each House of Parliament and prorogue or dissolve the Lok Sabha.

Ans 5. D

About University Grants Commission (UGC)

- The UGC is a statutory body under the UGC Act, 1956, responsible for coordinating, determining, and maintaining standards of higher education.
- It provides recognition to Indian universities, disburses funds to recognized universities and colleges, and operates under the Department of Higher Education, Ministry of Education.

Ans 6. B

Explanation:

- Black Tigers are a rare colour variant of the tiger and are not a distinct species or geographic subspecies.
- The coat colouration and patterning that make the wild cats appear dark boil down to a single mutation in the Transmembrane Aminopeptidase Q (Taqpep) gene.
- The abnormally dark or black coat in such tigers is termed pseudo melanistic or false coloured.
- If you pick any tiger from Similipal, the chance that it carries the mutant gene is almost 60%.
- Due to Geographic Isolation, genetically related individuals have been mating with each other for many generations in Similipal, leading to inbreeding.
- It should be noted that this has important implications for tiger conservation as such isolated and inbred populations are prone to extinction over even short periods of time. penicillin G, and ciprofloxacin, suggesting potential combined use.

Ans 7. C

Explanation:

Nuclear Power Station	Location
Kakrapar Atomic Power Station	Gujarat
Madras Atomic Power Station (Kalpakkam)	Tamil Nadu
Narora Atomic Power Station	Uttar Pradesh
Kaiga Nuclear Power Plant	Karnataka

Nuclear Power Station	Location
Rajasthan Atomic Power Station	Rajasthan
Tarapur Atomic Power Station	Maharashtra
Kudankulam Nuclear Power Plant	Tamil Nadu

Ans 8. B

Explanation:

Western Equine Encephalitis Virus (WEEV)

- WEEV belongs to the Togaviridae family, with an 11.5-kilobase single-stranded RNA genome.
- Passerine birds serve as reservoirs, while equine species act as intermediate hosts.
- Mosquitoes, as vectors, transmit the virus to humans, emphasizing the importance of vector control.

Control and Prevention Strategies

- **PAHO/WHO Alert:** PAHO/WHO has issued an alert on the risk of WEE spread in the Americas.
- **One Health Approach:** Emphasizes collaboration between human, animal, and environmental health sectors, crucial for effective control and prevention of the virus.
- **Interventions:** Environmental modifications, vector control, and equine vaccination are recommended in affected and high-risk regions. Enhanced surveillance and detection are crucial for preventing further spread.

Ans 9. D

Explanation:

Brain-Computer Interfaces (BCIs)

- Systems bridging human thought and technology.
- Non-invasive BCIs use EEG sensors for brain wave measurement outside the skull.
- Partially invasive BCIs employ electrodes under the scalp, providing higher resolution in specific brain areas.
- Fully invasive BCIs, like Neuralink's, interface directly with brain tissue, offering the highest resolution but raising ethical and safety concerns.

Application of Brain Computer Interface

- Human-technology interface revolutionizing technology interaction.
- Communication and Control: Aiding individuals with paralysis to control devices, prosthetics, or computers with their thoughts.
- Sensory Restoration: Addressing sight or hearing loss due to injuries or diseases.
- Neurological Treatment: Modulating brain activity to treat epilepsy, Parkinson's, and chronic pain.
- Augmentation and Enhancement: Potential amplification of cognitive abilities or memory.

Ans 10. D

Explanation:

In an election year, the incumbent Government cannot present a full Budget as there may be a change in the executive after the polls. Hence, the need for an interim budget. As there is no constitutional provision for an interim budget, the Centre can choose to seek the Lower House's approval for the funds required for the transition period (April - July) till the new government presents a full Budget— via the votes on account provision.

Ans 11. A

Explanation:

Grants mentioned in Article 116 of the Indian Constitution:

- **Exceptional Grants:** If a completely new service is to be introduced by the government outside the Budget, the Parliament is empowered to pass an exceptional Grant.
- **Vote of credit:** It is granted to meet some unexpected demands, which, due to their indefinite character, cannot be stated in detail. It is considered a blank cheque given to the executive. It could be a part of an 'interim Budget'.
- **Vote on Account:** It is granted when the government requires an advance sum for part of a financial year (say for 2-3 months) before the appropriation act is passed by the Parliament. For example, the demand for grants and the appropriation act take around two months to be passed by the Parliament. If the government want to run the ministries according to the new Budget, the Parliament can pass a 'Vote on Account' so that the government can function for the time being.

Ans 12. D

Explanation:

End-to-end encryption is vital for cybersecurity, safeguarding the secure transmission of sensitive data by encoding it exclusively for the sender and recipient. It provides protection against unauthorized access, theft, surveillance, and tampering, particularly in the face of escalating cyber threats.

What is Encryption?

- Encryption involves transforming consumable information into an unconsumable form according to various rules, fundamentally encompassing different rule sets.
- In this context, the key is a set of data that enables a computer to decrypt encrypted text by understanding the specific rules used to encrypt it.

E2E Encryption

- E2E encryption involves securing specific points through which data is transmitted.
- When communicating on a messaging app, messages are encrypted during transit to prevent unauthorized access, employing both encryption-in-transit and end-to-end encryption (E2E).
- Analogy:
 - Regular message: Sending a postcard - anyone can read it.
 - End-to-end encryption: Sending a sealed, coded letter - only the recipient with the right code can read it.

Ans 13. A

Explanation:

Similipal Tiger Reserve (STR)

- Located in Mayurbhanj district, Odisha, covering 2,750 km².
- Part of the Mayurbhanj Elephant Reserve, including Similipal Tiger Reserve, Hadagarh Wildlife Sanctuary, and Kuldiha Wildlife Sanctuary.
- Home to Bengal tigers, Asian elephants, gaur, and chausingha.
- Designated as a UNESCO World Network of Biosphere Reserves since 2009.
- Asia's second-largest biosphere and the only habitat for melanistic royal Bengal tigers in India.

Black Tigers or Melanistic Tigers

- Melanism is a genetic condition resulting in increased melanin production, causing black or nearly black skin, feathers, or hair.
- Similipal's royal Bengal tigers have a unique lineage with higher melanin levels, leading to black and yellow interspersed stripes (pseudo-melanistic).
- According to the 2022 All-India Tiger Estimation, 16 tigers recorded at STR, with 10 being melanistic.

Ans 14. A

Explanation:

Constitutional Viewpoint on Armed Forces Deployment

- Article 355 grants the central government authority to deploy forces for external aggression and internal disturbance without state request.
- If a state opposes deployment, the central government can issue directives under Article 355, resorting to Article 356 (President's Rule) if necessary.

Ans 15. D

Explanation:

About Article 355 of the Indian Constitution

- It is a part of emergency provisions contained in Part XVIII of the Constitution of India, from Article 352 to 360.
- It empowers the central government to take all necessary steps to protect a state against internal disturbances and external aggression.
- This article empowers the Centre to take necessary steps to protect a state from any kind of threat, be it internal or external.
- The provision is designed to ensure that the government can act swiftly and decisively in the event of any disturbance or threat to the peace and security of the country.
- Exact definition:
- The exact definition of Article 355 in the Constitution of India is, "It shall be the duty of the Union to protect every State against external aggression and internal disturbance and to ensure that the government of every State is carried on in accordance with the provisions of this Constitution."